(b) screening for function of the marker gene, wherein the function of the marker gene requires the presence of a polypeptide comprising a signal sequence and/or a transmembrane sequence.

115. A method for obtaining a candidate eukaryotic nucleic acid that encodes a polypeptide which comprises a signal sequence or a transmembrane sequence comprising:

(a) contacting a bacterial cell with a plasmid comprising a marker gene and the candidate eukaryotic nucleic acid;

(b) screening for function of the marker gene, wherein the function of the marker gene requires the presence of a polypeptide comprising a signal sequence and/or a transmembrane sequence; and

(c) isolating the candidate eukaryotic nucleic acid that encodes the polypeptide which comprises a signal sequence and/or a transmembrane sequence.

116. The method of claim 114 or 115, wherein the eukaryotic nucleic acid is selected from the group consisting of invertebrate nucleic acid and vertebrate nucleic acid.

117. The method of claim 116, wherein the vertebrate nucleic acid is a mammalian nucleic acid.

118. The method of claim 117, wherein the mammalian nucleic acid is selected from the group consisting of a mouse nucleic acid and a human nucleic acid.

119. The method of claim 114 or 115, wherein the eukaryotic nucleic acid is selected from the group consisting of a fat cell nucleic acid, a cancer cell nucleic acid, and an immortalized cell nucleic acid.

120. The method of claim 119 wherein the cancer cell nucleic acid is selected from the group consisting of a tumor cell nucleic acid and a metastatic cell nucleic acid.

121. The method of claim 119 wherein the cancer cell nucleic acid is a breast cancer cell nucleic acid.

122. The method of claim 121 wherein the breast cancer cell nucleic acid is an immortalized breast cancer cell nucleic acid selected from the group consisting of a MCF7 cell nucleic acid, an SKBR-3 nucleic acid, a MDA-MB-231 nucleic acid, a MCF6 nucleic acid, a T47D nucleic acid, and an MDA-MB-435 nucleic acid.

123. The method of claim 114 or 115, wherein the marker gene contains a mutation in the coding region for a signal sequence and/or a transmembrane sequence of the encoded marker polypeptide.

124. The method of claim 114 or 115, wherein the marker gene is a selectable marker gene and wherein the screening for function of the marker gene comprises assaying for survival of the bacterial cell and/or its progeny on selectable media.

125. The method of claim 124, wherein the survival of the bacterial cell and/or its progeny on selectable media indicates that the candidate eukaryotic nucleic acid encodes a polypeptide comprising a signal sequence and/or a transmembrane sequence.

126. The method of claim 115 wherein a plurality of candidate eukaryotic nucleic acids are isolated.

127. The method of claim 115, further comprising sequencing the isolated candidate eukaryotic nucleic acid.

128. The method of claim 115, further comprising expressing the candidate eukaryotic nucleic acid and identifying and isolating the expressed polypeptides encoded by the candidate eukaryotic nucleic acid.

129. The method of claim 128, further comprising analyzing the function of the isolated polypeptide.

130. The method of claim 128, further comprising correlating the eukaryotic nucleic acid and/or the polypeptide encoded thereby to a disease, state of physiological condition, or other condition.

131. The method of claim 130 wherein the disease is selected from the group consisting of an endocrine disease, a renal disease, a cardiovascular disease, a rheumatologic disease, a

hematologic disease, a neurological disease, an oncological disease, a pulmonary disease, an autoimmune disease, a dermatological disease and a gastrointestinal disease.

132. The method of claim 131 wherein the disease is cancer.

133. The method of claim 128 further comprising correlating the eukaryotic nucleic acid and/or the polypeptide encoded thereby to a physiological condition.

134. The method of claim 133 wherein the physiological condition is a state of fat metabolism.

135. The method of claim 114 or 115 wherein the bacterial cell is selected from the group consisting of a gram negative bacterial cell and a gram positive bacterial cell.

136. The method of claim 135 wherein the bacterial cell is an *Escherichia coli* cell.

137. The method of claim 114 or 115 wherein the marker gene is selected from the group consisting of a screenable marker gene, a scorable marker gene, a measurable marker gene and a selectable marker gene.

138. The method of claim 137 wherein the screenable marker gene is detectable by a detection method selected from the group consisting of a fluorescence method, a colorimetric method, a radioactive method, and an enzymatic method.